SECTION 07412

MANUFACTURED WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Factory-assembled, factory insulated metal wall panels with gasketed seams:
      a. Type 1A: Architectural metal wall panels for Building 8610, CNMS.
      b. Type 1B: Architectural metal wall panels for Building 8610, CNMS.

B. Related Sections:
   1. Division 5 Section "Structural Steel" for structural-steel framing.
   2. Division 7 Section "Joint Sealants" for field-applied sealants.
   3. Division 8 Section “Exterior Wall Systems - General”, for requirements for exterior wall components.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide manufactured wall panel assemblies complying with performance requirements indicated and capable of withstanding structural movement, thermally induced movement, and exposure to weather without failure or infiltration of water into the building interior.

B. Air Infiltration: Provide manufactured wall panel assemblies with permanent resistance to air leakage through assembly of not more than 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24 lbf/sq. ft.

C. Water Penetration: Provide manufactured wall panel assemblies with no water penetration as defined in the test method when tested according to ASTM E 331 at a minimum differential pressure of 20 percent of inward acting, wind-load design pressure of not less than 6.24 lb/sq. ft. and not more than 12.0 lb/sq. ft..

D. Structural Performance: Provide manufactured wall panel assemblies capable of withstanding design wind loads indicated under in-service conditions with deflection no greater than the following, based on testing manufacturer's standard units according to ASTM E 330 by a qualified independent testing and inspecting agency.
   1. Maximum Deflection: 1/180 of the span.

E. Thermal performance of the wall panels shall be based on tests in accordance with ASTM C 236 corrected to 15 mph outside and still air inside. Tests shall include side joint, standard fastening and reveals.

F. Panels and secondary support systems shall be designed for component and cladding wind loads determined in accordance with the more stringent of the local building code or ASCE 7-95 for the parameters specified.
   1. Importance Factor: Varies. Refer to structural drawings.
   2. Exposure Category: C
   3. Basic Wind Speed: 90mph per ASCE 7-95.

G. Secondary support framing systems for all openings up to and including 7 feet wide in Type 2 wall panels shall be designed and engineered by the panel manufacturer. Secondary support systems for openings greater than 7 feet shall be provided as shown on Drawings.
   1. Steel Framing for Target Building: Attach metal panels to the steel framing as shown on the Drawings.

H. Secondary Support Systems shall not vary from the theoretical plane by more than the specified tolerances:
   1. ¼ inch in any 20 foot length vertically or horizontally.
   2. ½ inch in any building elevation
   3. 1/8 inch within 5 feet of any change in plane such as corners and soffits.

I. Panels and secondary support systems shall be designed for component and cladding seismic loads determined in accordance with the Uniform Building Code UBC-97 and for the parameters specifications listed below.
   1. UBC Seismic Zone 2A
   2. Importance Factor : Varies. Refer to structural drawings.
   3. DOE Seismic Performance Category: Varies. Refer to structural drawings.
   4. Site Specific Design Response Spectra: 500-Year Return Period

J. Support systems shall be attached to slab edges. Perimeter spandrel beams are not designed to accommodate lateral forces. Slab edges have been designed to accommodate a maximum dead load of two stories of exterior enclosure. Slab edge inserts for dead load and wind load connections are to be engineered by the manufacturer/installer. Provide for vertical movements (thermal, structural, etc.) at two floor intervals, maximum

1.4 SUBMITTALS

A. Product Data: Include manufacturer's product specifications, standard details, certified product test results, and general recommendations, as applicable to materials and finishes for each component and for total panel assemblies.

B. Shop Drawings: Show layouts of panels, details of corner conditions, joints, panel profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work.
   1. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: Provide sample panels 12 inches long by actual panel width, in the profile, style, color, and texture indicated. Include clips, caps, battens, fasteners, closures, and other exposed panel accessories.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer, with 5 to 10 years experience, who has completed metal wall panel projects similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated.

C. Mockups: Before installing wall panels, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using exposed and concealed materials indicated for the completed Work.
   1. Locate mockups in the location and of the size indicated or, if not indicated, as directed by Construction Manager.

2. Notify Construction Manager 7 days in advance of the dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Construction Manager's approval of mockups before proceeding with construction of wall panels.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   a. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver panels and other components so they will not be damaged or deformed. Package panels for protection against damage during transportation or handling.

B. Handling: Exercise care in unloading, storing, and erecting wall panels to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight and ventilated covering. Store panels to ensure dryness. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, either establish opening dimensions and proceed with fabricating wall panels without field measurements or allow for trimming panel units. Coordinate wall construction to ensure actual locations of structural members and to ensure opening dimensions correspond to established dimensions.

1.8 WARRANTY

A. Special Finish Warranty: Submit a written warranty, signed by manufacturer, covering failure of the factory-applied exterior finish on metal wall panels within the specified warranty period and agreeing to repair finish or replace wall panels that show evidence of finish deterioration. Deterioration of finish includes, but is not limited to, color fade, chalking, cracking, peeling, and loss of film integrity.

B. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Products: The design for each metal wall panel specified is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other listed manufacturers specified below.
   1. Type 1A: Architectural metal wall panels: Centria Formawall Dimension Series
   2. Type 1B: Architectural metal wall panels: Centria Formawall FWDS-60 2” panel.

B. Other Listed Manufacturers:
   1. Alply, Inc.
   2. Benchmark Architectural Systems, Inc.
   3. CBS
   4. Protean, Inc.

2.2 METALS AND FINISHES

A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755 and the following requirements:
   1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
   2. Exposed Finish for Exterior Panels: Apply the following coating in thickness indicated. Furnish appropriate air-drying spray finish in matching color for touchup.
      a. Fluoropolymer 2-Coat Coating System: Manufacturer's standard 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight with a total minimum dry film thickness of 0.9 mil and 30 percent reflective gloss when tested according to ASTM D 523.
         1) Durability: Provide coating field tested under normal range of weather conditions for a minimum of 20 years without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of 5 Hunter units.
         2) Color: Match Construction Manager's sample.
         3) Pearlescent Finish: Provide manufacturer’s pearlescent finish containing mica flakes.
   3. Exposed Finish for Interior Panels: Apply the following:
      a. Acrylic-Enamel Coating: Consisting of epoxy primer and acrylic-enamel topcoat, with a dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
         1) Color: As indicated by manufacturer's color designations.
   4. Prime Coat for Concealed Surfaces: Apply pretreatment and white or light-colored, baked-on polyester primer coat; with a minimum dry film thickness of 0.2 mil.

2.3 TYPE 1 – ARCHITECTURAL WALL PANEL ASSEMBLIES

A. Insulated Wall Panels: Fabricate panels in a manner that will eliminate condensation on the interior side. Design joints between panels to form weathertight seals. Insulating core of panels shall provide R-value indicated.
   1. Provide factory-assembled, wall panel units consisting of a specified core material laminated or otherwise securely bonded to metal interior and exterior face sheets.
      a. Exterior Face Sheet: 20 gage, metallic-coated steel sheet with organic coating finish, unless otherwise indicated.
      b. Interior Face Sheet: 20 gage, metallic-coated steel sheet with organic coating finish, unless otherwise indicated.
   2. Panel Type 1A Surface: Smooth, flat, surface.
   3. Panel Type 1B Surface: Ribbed surface.

B. Joinery: Provide double tongue and groove joint that can be installed vertically and horizontally.
   1. Horizontal applications shall have integral venting where required along panel length and a 2-3/8 inch gutter interlock to provide effective rain screen and pressure equalized performance as demonstrated by testing specified.
   2. Provide 1 inch horizontal panel joint integral with the panel

C. Core: Poured-in-Place Polyurethane Foam: Polyurethane foam with at least 90 percent closed-cell structure and the following characteristics:
   1. Density: 2.7 lb/cu. ft.
   2. Thermal Resistance: R-Value R-22 for CNMS Building 8610;
   3. Compressive Strength: 20 psi minimum.
   4. Tensile Strength: 30 psi minimum.
   5. Humid Aging: 250 hours at 122 deg F, 100 percent humidity, 6 percent maximum increase.

6. Heat Aging: 250 hours at 180 deg F, 100 percent humidity, 4 percent maximum increase.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads.
   1. Use stainless-steel fasteners for exterior applications and galvanized steel fasteners for interior applications.

B. Accessories: Unless otherwise specified, provide components required for a complete wall panel assembly including trim, copings, sills, corner units, clips, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match materials and finishes of panels.
   1. Trim: Extruded aluminum 6063-T5.
   2. Closure Strips: Closed-cell, self-extinguishing, expanded, cellular, rubber or cross-linked, polyolefin-foam flexible closure strips. Cut or premold to match configuration of panels. Provide closure strips where indicated or necessary to ensure weathertight construction.
   3. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

C. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat, unless otherwise indicated. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.5 FABRICATION

A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials that are noncompatible or could result in corrosion or deterioration of either materials or finishes.

C. Fabricate panel joints with captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will minimize noise from movements within panel assembly.

2.6 SECONDARY FRAMING

A. Panel Supports and Anchorage: Provide furring channels, angles, plates, bracing, and other secondary framing members.
   1. Flange and Sag Bracing: 1-5/8-by-1-5/8-inch angles, fabricated from 0.0598-inch- thick, shop-painted, roll-formed steel.
   2. Base or Sill Angles: Fabricate from 0.079-inch- thick, cold-formed, galvanized steel sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements indicated for conditions affecting performance of metal panel walls.
   1. Panel Supports and Anchorage: Examine wall framing to verify that girts, angles, and other secondary structural panel support members and anchorage have been installed to meet requirements of panel manufacturer.

2. Do not proceed with wall panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate metal wall panels with rain drainage work; flashing; trim; and construction of soffits, roofing, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

B. Promptly remove protective film, if any, from exposed surfaces of metal panels. Strip with care to avoid damage to finish.

3.3 PANEL INSTALLATION

A. General: Comply with panel manufacturer's written instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Field cutting exterior panels by torch is not permitted.
   2. Install panels with concealed fasteners.
   3. Locate and space exposed fasteners in true vertical and horizontal alignment. Use proper tools to obtain controlled, uniform compression for positive seal without rupture of neoprene washer.

B. Accessories: Install components required for a complete wall panel assembly including trim, copings, fasciae, mullions, sills, corner units, clips, seam covers, flashings, louvers, sealants, gaskets, fillers, closure strips, and similar items.

C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not otherwise indicated, types recommended by panel manufacturer.
   1. Install weatherseal to prevent air and moisture penetration. Flash and seal panels at ends and intersections with other materials with rubber, neoprene, or other closures to exclude weather.
   2. Seal panel end laps with a bead of tape or sealant, full width of panel. Seal side joints where recommended by panel manufacturer.

D. Wall Panels: Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as necessary for waterproofing. Handle and apply sealant and back-up according to sealant manufacturer's written instructions.
   1. Align bottom of wall panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
   2. Install screw fasteners with power tools having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
   3. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

E. Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating or by other permanent separation as recommended by manufacturers of dissimilar metals.

F. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4 inch in 20 feet on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.4 CLEANING AND PROTECTING

A. Damaged Units: Replace panels and other components of the Work that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

B. Cleaning: Remove temporary protective coverings and strippable films, if any, as soon as each panel is installed. On completion of panel installation, clean finished surfaces as recommended by panel manufacturer and maintain in a clean condition during construction.

END OF SECTION 07412